

DRINKING WATER SOURCE PROTECTION PLAN

Standard Report Format for Existing Wells and Springs

October 2000

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STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF DRINKING WATER

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DRINKING WATER SOURCE PROTECTION PLANS

R309-600 of the Utah Administrative Code

If the Standard Report Format identified in this document is followed, the Division of Drinking Water (DDW) should be able to provide a timely review and response. If it is not followed, the writer must ensure that each item is adequately addressed. Letters of response will always reference sections of this document. To ensure that each plan is complete, please number each section of the DWSP Plan to match the sections of the Standard Report Format.

Purpose of Drinking Water Source Protection Plans

Drinking Water Source Protection (DWSP) plans are the primary means for public water systems (PWS) to protect their sources of drinking water from contamination. These plans should not be developed just to meet the "letter of the law" required by the Rule. ***They must be working documents that will be used on a regular basis by the PWS. The DWSP plan should be written as a How-to handbook for the water system to protect their sources of drinking water now and in the future.*** They should be logical and easily understood. The implementation schedule is one of the most important sections of the DWSP plan because it is a summary list containing every land management strategy and beginning implementation date that will be carried out by the PWS.

The DWSP Rule applies to all ground-water sources of drinking water, which are used by PWSs to supply their systems. Additionally, compliance with this rule is voluntary for existing ground-water sources of drinking water which are used by public (transient) non-community water systems. PWSs are required to update their DWSP Plans as often as necessary to ensure they show current conditions in the DWSP zones and management areas. DWSP Plans are initially due according to the schedule in R309-600-3. Thereafter, updated DWSP Plans are due every six years from their original due date. This applies even though a PWS may have been granted an extension beyond the original due date.

Note: Drinking Water Source Protection (DWSP) Plans may be developed for existing sources and for new sources that have approved Preliminary Evaluation Reports. If this plan is for a proposed new well or spring, you must prepare and submit a Preliminary Evaluation Report before you develop a Drinking Water Source Protection Plan for it. Please refer to the *Standard Report Format for New Wells and Springs* for specific instructions.

EXECUTIVE SUMMARY

Include a brief summary of this report.

1.0 INTRODUCTION

1.1 System Information:

Include the water system name, number, and address. Is it a new or an existing water system? Is it a public or a non-public water system? If public, is it a community, a non-transient/non-community, or a transient/non-community water system? The first name of a new water system submitted to DDW will be the name under which it will be tracked in the future. Please ensure, to the best of your ability, that the name established for the water system remain the same. A water system number will be assigned to that name.

1.2 Source Information:

Include the source name. Is it a new source or an existing source? Is it a well, spring, or tunnel? Is it an individual source, a wellfield, or a springfield? Is this source already constructed? Include a brief description of the source location.

1.3 Designated Person - R309-600-5:

Include the name, address, and phone number of the designated person. This information must be included in each DWSP plan that is submitted to DDW. Correspondence regarding this report and future correspondence will be directed to the designated person.

2.0 THE DELINEATION REPORT - R309-600-9(5)

Include the following information and a list of all sources or references for the information:

2.1 Geologic Data - R309-600-9(5)(a)(i):

A brief description of geologic features and aquifer characteristics observed in the well and area of the potential protection zones. This should include the formal or informal stratigraphic name(s), lithology of the aquifer(s) and confining unit(s), and description of fractures and solution cavities (size, abundance, spacing, orientation) and faults (brief description of location in or near the well, and orientation). Lithologic descriptions can be obtained from surface hand samples or well cuttings; core samples and laboratory analyses are not necessary. Fractures, solution cavities, and faults may be described from surface outcrops or drill logs.

2.2 Well or Spring Construction Data - R309-600-9(5)(a)(ii) & (iii):

If the source is a well, include the following information: If the source is a well, the report shall include the well drillers log, elevation of the wellhead, borehole radius, casing radius, total depth of the well, depth and length of the screened or perforated interval(s), well screen or perforation type, casing type, method of well construction, type of pump, location of pump in the well, and the maximum projected pumping rate of the well. The maximum pumping rate of the well must be used in the delineation calculations. Averaged pumping rate values shall not be used.

If the source is a spring or tunnel, include the following information: A description or diagram of the collection area and method of ground-water collection.

2.3 Aquifer Data - R309-600-9(5)(a)(iv):

Include the following aquifer properties:

Calculated hydraulic conductivity obtained from a constant-rate test, transmissivity, hydraulic gradient, direction of ground-water flow, estimated effective porosity, and saturated thickness of the producing aquifer(s).

The constant-rate test shall:

Provide for continuous pumping for at least 24 hours or until stabilized drawdown has continued for at least six hours. Stabilized drawdown is achieved when there is less than 0.5 foot of change of ground-water level in the well within a six-hour period. Additionally, provide data as described in R309-204-6(10)(b).

If a constant-rate aquifer test is not practical, then the hydraulic conductivity of the aquifer must be obtained using another appropriate method, such as data from a nearby well in the same aquifer, specific capacity of the well, published hydrogeologic studies of the same aquifer, or local or regional ground-water models.

A constant-rate test may not be practical for such reasons as insufficient drawdown in the well, inaccessibility of the well for water-level measurements, or insufficient overflow capacity for the pumped water.

Additional Data for Observation Wells:

If the aquifer test is conducted using observation wells, the report shall include the following information for each observation well: location and surface elevation; total depth; depth and length of the screened or perforated

intervals; radius, casing type, screen or perforation type, and method of construction; prepumping ground-water level; the time-drawdown or distance-drawdown data and curve; and the total drawdown.

2.4 Hydrogeologic Methods and Calculations - R309-600-9(5)(a)(vii):

Include the hydrogeologic method used to delineate the protection zones, all applicable equations, values, and the calculations which determine the delineated boundaries of zones two, three, and four. If a computer model was used, include a description of the model and the parameters input into the model, as well as any assumptions behind the model or input values. Include any printouts of the data or graphical presentations from the computer program. Raw data and other output from the computer program may be included in an appendix. The hydrogeologic method or ground-water model must be reasonably applicable for the aquifer setting. For wells, the hydrogeologic method or ground-water model must include the effects of drawdown (increased hydraulic gradient near the well) and interference from other wells.

2.5 Map Showing Boundaries of the DWSP Zones - R309-600-9(5)(a)(viii):

- a. A map showing the location of the ground-water source of drinking water and the boundary for each DWSP zone. The base map shall be a 1:24,000-scale (7.5-minute series) topographic map, such as is published by the U.S. Geological Survey. Although zone one (100-foot radius around the well or margin of the collection area) need not be on the map, the complete boundaries for zones two, three, and four must be drawn and labeled. More detailed maps are optional and may be submitted in addition to the map required above.
- b. Include a written description of the distances which define the delineated boundaries of zones two, three, and four. These written descriptions must include the maximum distance upgradient from the well, the maximum distance downgradient from the well, and the maximum widths of each protection zone.

2.6 Protected or Unprotected Aquifer Classification - R309-600-9(3) & (6):

If the source is a well, indicate whether it meets the following criteria: 1) A naturally protective layer of clay, at least 30 feet in thickness, is present above the aquifer; 2) data to indicate the lateral continuity of the clay layer extends throughout zone two; and 3) the well is constructed with a grout seal that extends from the ground surface down to at least 100 feet below the surface, and through the protective clay layer (R309-600-6(1)(v)). If these criteria are met, the aquifer may be considered to be

protected. *If this section is not addressed or the case for protected aquifer status is not properly justified then the aquifer will be classified as unprotected.*

The ground-water professional must state that the aquifer meets the definition of a protected aquifer based on the following information which must be included in the report: 1) Thickness, depth, and lithology of the protective clay layer; 2) data to indicate the lateral continuity of the protective clay layer over the extent of zone two. This may include such data as correlation of beds in multiple wells, published hydrogeologic studies, stratigraphic studies, potentiometric surface studies, and so forth; and 3) evidence that the well has been grouted or otherwise sealed from the ground surface to a depth of at least 100 feet and for a thickness of at least 30 feet through the protective clay layer in accordance with R309-204-6(1)(v) and R309-600-6(1)(v). Include construction methods. If sufficient information is presented to indicate the ground water will be protected from contaminant sources at the surface, the aquifer may still receive a *protected* designation, even though, the above criteria are not met.

Susceptibility waivers are an important reason for determining whether a source is located in a protected aquifer. Protected aquifer status is the most important criterion that is considered when a PWSs application for a source's susceptibility waivers for the pesticide and VOC parameter groups is reviewed.

3.0 THE INVENTORY OF POTENTIAL CONTAMINATION SOURCES - R309-600-10

The following information about potential contamination sources (PCSs) may be organized in any manner that formats the data into an arrangement that is easy to understand and reference (information sheets, tables, etc). Ensure that each section (3.1 through 3.5) is addressed.

3.1 List Potential Contamination Sources - R309-600-10(1):

Use the list in Chapter 5 of the Ground Water Source Protection User's Guide and any other appropriate guidance to compile a list of PCSs that are within the four protection zones or the entire management area. Include the name and address of each PCS. The name, address, and phone number of a PCS contact person is required for each commercial and industrial facility and suggested for all others.

3.2 Identify Hazards:

List the chemical, biological, and/or radiological substances used, stored, manufactured, transported, and disposed at each PCS. If there are no hazards associated with PCS, it may not, in fact, be a PCS. Refer to Chapter 5 of the Source Protection User's Guide for the definition of a *potential contamination source*.

3.3 Prioritize the Inventory - R309-600-10(1)

Arrange the list of PCSs that are located within the four protection zones or the entire management area into a greatest to least risk priority order and state the basis for the order.

3.4 Potential Contamination Source Location - R309-600-10(1)

Include a description which identifies each PCS as to its location in zone one, two, three, four or in a management area.

3.5 Potential Contamination Sources Plotted on Map

PCSs must be plotted on the map required in Section 2.5a of this document.

4.0 THE ASSESSMENT OF POTENTIAL CONTAMINATION SOURCE HAZARDS – R309-600-10(2)

There are four types of hazard controls: Regulatory, best management/pollution prevention, physical, and negligible quantity controls. PWSs are not required to plan and implement land management strategies for potential contamination source hazards that are assessed as *adequately controlled*. Hazards that are assessed *adequately controlled* must be reassessed periodically to ensure that conditions do not worsen without your knowledge. A reassessment date must be established according to the instructions which follow.

Any hazard that is not assessed as *adequately controlled* will be considered to be *not adequately controlled*. Additionally, if the hazards at a PCS cannot be identified, the potential contamination source must be assessed as *not adequately controlled*. Many PCS hazards have no controls and must be assessed as *not adequately controlled*. Refer to Chapter 7 of the Ground Water Source Protection User's Guide for a discussion about planning land management strategies for these PCSs. It is usually redundant to identify more than one hazard control; therefore, only one hazard control should be identified for each hazard. The instructions for assessing each type of control must be followed exactly or the assessment will be considered to be incomplete. Refer to the Ground Water Source Protection User's Guide for a list of government agencies and the programs they administer to control PCSs. This guide may be obtained from DDW.

Identify and Assess Regulatory Controls - R309-600-10(2)(a):

Regulatory controls are the codes, ordinances, rules, and regulations that are in effect to control a PCS hazard. The following six steps are required to assess a hazard as adequately controlled by a regulatory control: 1) Identify the enforcement agency; 2)

quote and/or cite specific references in the regulation, rule, or ordinance which pertain to controlling this hazard; 3) explain how this regulatory control will prevent ground-water contamination; 4) verify that this PCS hazard is actually being regulated by the enforcement agency; 5) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change; and 6) set a date to reassess this control.

Identify and Assess Best Management and Pollution Prevention Practices – R309-600-10(2)(b):

Identify the best management and pollution prevention practices that are currently being used by the PCS to control the hazardous substances at the facility. The following five steps are required to assess a hazard as adequately controlled by best management and pollution prevention practices: 1) List the specific best management and pollution prevention practices which are being used to control this hazard; 2) indicate that PCS management is willing to continue the use of these practices to prevent ground-water contamination; 3) explain how these best management and pollution prevention practices will prevent ground-water contamination; 4) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change; and 5) set a date to reassess this control.

Identify and Assess Physical Controls – R309-600-10(2)(c):

Physical controls are man-made structures and impoundments, such as spill protection structures, that are in place to stop a hazard from entering the ground water. The following four steps are required to assess a hazard as adequately controlled by a physical control: 1) Describe the physical control(s) which have been constructed to control this hazard; 2) explain how these controls prevent contamination; 3) assess the hazard as *adequately controlled* and indicate that no further land management strategies will be planned and implemented unless conditions change; and 4) set a date to reassess this control.

Identify and Assess Negligible Quantity Controls – R309-600-10(2)(d):

Negligible quantity controls refer to the amount or toxicity of a hazardous substance that is used at a PCS facility. It means that quantity or toxicity is so low that the risk of ground-water contamination is negligible and not worth the time and effort to plan land management strategies to control it. The following four steps are required to assess a hazard as adequately controlled by a negligible quantity control: 1) Identify the hazardous substance and the quantity that is being used, disposed, stored, or transported; 2) explain why this amount should be considered a negligible quantity; 3) assess the hazard as *adequately controlled* and indicate that no further land

management strategies will be planned and implemented unless conditions change; and 4) set a date to reassess this control.

5.0 MANAGEMENT PROGRAM FOR EXISTING POTENTIAL CONTAMINATION SOURCES - R309-600-11

This section is intended to be a well thought out plan that will be implemented by the PWS to control PCS hazards. Land management strategies are required to be planned for each PCS hazard that is assessed as *not adequately controlled*. It is not acceptable for the plan to simply contain a list of land management strategies that are recommended by the consultant. The PWS must concur with the land management strategies, which are included in this report, and be willing to carry them out.

- 5.1 Plan land management strategies to control the chemical, biological, and radiological substances that have been identified at each PCS that is assessed as *not adequately controlled*. Land management strategies must be planned to control the hazards identified at each PCS and be in accordance with the authority and jurisdiction of the PWS. Land management strategies may be regulatory and/or non-regulatory.
- 5.2 Include a discussion of the specific best management practices, pollution prevention, and other land management strategies that are being proposed to control potential contamination (refer to Appendix G of the Source Protection Users Guide for AFact Sheets® that are available from DDW).

6.0 THE MANAGEMENT PROGRAM FOR FUTURE POTENTIAL CONTAMINATION SOURCES - R309-600-12

- 6.1 Management Program - R309-600-12(4):

If zoning ordinances are used, provide the following information: Discuss specific sections of the zoning ordinance that are planned or that have been promulgated and explain how they control or will control future PCSs.

If zoning ordinances are not used, provide the following information: Identify the plan to contact PCSs individually as they move into protection zones, include them on the inventory of PCSs, identify and assess current controls, and plan land management strategies if they are not adequately controlled.

7.0 THE IMPLEMENTATION SCHEDULE - R309-600-7(1)(e)

The implementation schedule is a list of the land management strategies which have been identified by the PWS for both existing and future PCSs with a beginning implementation date for each one. Each PCS listed on the inventory required in R309-600-10(1) and assessed as *not adequately*

controlled@ must be addressed. PWSs are required to implement land management strategies as specified in this schedule.

8.0 THE RESOURCE EVALUATION - R309-600-7(1)(f)

Include the resource evaluation, which is a discussion of the financial and other resources that are required for the PWS to implement this DWSP Plan and a determination of how these resources are to be acquired.

9.0 THE RECORDKEEPING SECTION - R309-600-7(1)(g)

This section is included for the PWS to document changes as the plan is continuously updated to show current conditions in the protection zones and management areas. As the plan is executed, the PWS must document the implementation of each land management strategy as it is implemented. This includes copies of ordinances, codes, permits, memoranda of understanding, public education programs, training session agendas, minutes of meetings, diary entries, memoranda for the file, etc.

10.0 THE CONTINGENCY PLAN - R309-600-14

Include a contingency plan which addresses all sources of drinking water for the entire water system. This plan is only due once and is usually submitted concurrently with the submission of the first DWSP plan for the system. Guidance for developing Contingency Plans may be found in Chapter 10 of the Ground Water Source Protection User's Guide. This document may be obtained from DDW. *A DWSP plan cannot be concurred with until the requirement for a system contingency plan has been satisfied.*

11.0 PUBLIC NOTIFICATION – R309-600-15

- 11.1 Public Notification Plan - Each PWS shall append a Public Notification Plan to its next DWSP plan that is submitted to DDW. This includes plans that are submitted late or have been granted extensions. This Public Notification Appendix shall specify a schedule and method(s) to notify the PWS's customers and consumers of the general conclusions of their DWSP planning and shall generally address all of its ground-water sources of drinking water.
- 11.2 Public Notifications - The first public notification shall be included in the Recordkeeping Section of the plan which is submitted in accordance with R309-600-15(1). This public notification must be released to the public within 30 days of the plan being submitted, whether or not the plan has been reviewed by DDW, or it must be contained in the PWS's next Consumer Confidence Report. Consumer Confidence Reports are released to the public annually by July 31st of the current year. All other public notifications shall be in accordance with the Public Notification Plan schedule and method(s) required in R309-600-15(1) and be

included in the Recordkeeping Section of the designated plan. Public Notifications shall address all of the PWS's ground-water sources and include a discussion of the following:

- a. The general geologic and physical setting of the sources;
- b. the general types of potential contamination sources within the protection zones;
- c. a susceptibility analysis that addresses the following: 1) the geologic characteristics of the aquifer(s) (protected, unprotected, unknown), 2) the integrity of the grout seal of the well(s) or the impervious seal over the spring collection area(s), 3) a general assessment of the potential contamination sources as to whether they are controlled or uncontrolled, and 4) a summary statement of how susceptible the PWSs wells and springs are to contamination from the highest ranking potential contamination sources on their prioritized list; and
- d. a summary of the land management strategies that are being implemented to manage existing and future potential contamination source hazards.

- 11.3 The public must be notified that complete DWSP plans are available to them upon request.

Examples of means of notifying the public and examples of public notification material are discussed in the "Ground Water Source Protection User's Guide" which may be obtained from DDW.

WAIVERS

Three types of monitoring waivers are available to PWSs. They are: reliably and consistently, use, and susceptibility. The criteria for establishing a reliably and consistently waiver is set forth in R309-104. The criteria for use and susceptibility waivers follow.

If a source's DWSP plan is due according to the schedule in R309-600-3, and is not submitted to the Division of Drinking Water (DDW), its use and susceptibility waivers for the VOC and pesticide parameter groups will expire unless an exception (refer to R309-600-4) for a new due date has been granted. Additionally, current use and susceptibility waivers for the VOC, pesticide and unregulated parameter groups will expire upon review of a DWSP plan, if these waivers are not addressed in the plan.

Use Waivers

If the chemicals within the VOC and/or pesticide parameter group(s) have not been used within the past five years within zones one, two, and three, the source may be eligible for a use waiver. To qualify for a VOC and/or pesticide use waiver, a PWS must complete the following two steps:

List the chemicals which are used, disposed, stored, transported, and manufactured at each potential contamination source within zones one, two, and three where the use of the chemicals within the VOC and pesticide parameter groups are likely; and submit a dated statement which is signed by the system's designated person that none of the VOCs and pesticides within these respective parameter groups have been used, disposed, stored, transported, or manufactured within the past five years within zones one, two, and three.

Susceptibility Waivers

If a source does not qualify for use waivers, and if reliably and consistently waivers have not been issued, it may be eligible for susceptibility waivers. Susceptibility waivers tolerate the use, disposal, storage, transport, and manufacture of chemicals within zones one, two, and three as long as the PWS can demonstrate that the source is not susceptible to contamination from them. To qualify for a VOC and/or pesticide susceptibility waiver, a PWS must complete the following three steps:

Submit the monitoring results of at least one applicable sample from the VOC and/or pesticide parameter group(s) that has been taken within the past five years. A non-detectable analysis for each chemical within the parameter group(s) is required; submit a dated statement from the designated person verifying that the PWS is confident that a susceptibility waiver for the VOC and/or pesticide parameter group(s) will not threaten public health; and verify that the source is developed in a protected aquifer, as defined in R309-600-6(1)(v), and have a public education program which addresses proper use and disposal practices for pesticides and VOCs which is described in the management sections of the DWSP plan.

Special Waiver Conditions

Special scientific or engineering studies or best management practices may be developed to support a request for an exception to paragraph R309-600-16(4)(c) due to special conditions. These studies must be approved by DDW before the PWS begins the study. Special waiver condition studies may include: geology and construction/grout seal of the well to demonstrate geologic protection; memoranda of agreement which addresses best management practices for VOCs and/or pesticides with industrial, agricultural, and commercial facilities which use, store, transport,

manufacture, or dispose of the chemicals within these parameter groups; public education programs which address best management practices for VOCs and/or pesticides; contaminant quantities; affected land area; and/or fate and transport studies of the VOCs and/or pesticides which are listed as hazards at the PCSs within zones one, two, and three, and any other conditions which may be identified by the PWS and approved by DDW.